

Physical Science

Quarter 1 – Module 13:

Use of the Other Ingredients in Cleaning Agents



Physical Science
Alternative Delivery Mode
Quarter 1 – Module 13: Use of the Other Ingredients in Cleaning Agents
First Edition 2020

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Published by the Department of Education
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Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by _____

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Physical Science

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Use of the Other Ingredients in Cleaning Agents

Introductory Message

For the facilitator:

Welcome to the Physical Science 11 Alternative Delivery Mode (ADM) Module on Use of the Other Ingredients in Cleaning Agents!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:



Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Physical Science 11 Alternative Delivery Mode (ADM) Module on Use of the Other Ingredients in Cleaning Agents!

The hand is one of the most symbolized part of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:



What I Need to Know

This will give you an idea of the skills or competencies you are expected to learn in the module.



What I Know

This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.



What's In

This is a brief drill or review to help you link the current lesson with the previous one.



What's New

In this portion, the new lesson will be introduced to you in various ways such as a story, a song, a poem, a problem opener, an activity or a situation.



What is It

This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.



What's More

This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.



What I Have Learned

This includes questions or blank sentence/paragraph to be filled into process what you learned from the lesson.



What I Can Do

This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.



Assessment

This is a task which aims to evaluate your level of mastery in achieving the learning competency.



Additional Activities

In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned. This also tends retention of learned concepts.



Answer Key

This contains answers to all activities in the module.

At the end of this module you will also find:

References

This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!

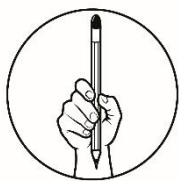


What I Need to Know

This module was designed and written with you in mind. It is here to help you master the use of the other ingredients in cleaning agents. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module focuses on the use of the other ingredients in cleaning agents.

After going through this module, you are expected to give the use of the other ingredients in cleaning agents.



What I Know

Direction: Write the chosen letter on a separate sheet of paper.

1. Aside from the active ingredient, there are also other ingredients included in cleaning agents. This ingredient helps in keeping the minerals out of the way of the surfactants.

- a. builders
- b. fragrance
- c. pH adjusters
- d. solvents

2. Depending on the chosen ingredient used in a product, what is the ingredient that helps to be more effective on certain microbes?

- a. antibacterial
- b. enzymes
- c. foam enhancer
- d. preservatives

3. Adding of this ingredient in a certain liquid cleaning agent will decrease the viscosity of the liquid. What is this ingredient?

- a. dye
- b. enzymes
- c. solvents
- d. thickener

4. Many people feel bubbles show that a product is working. What is the ingredient that creates suds in a cleaning agent?

- a. dye
- b. foam enhancer
- c. pH adjuster
- d. preservatives

5. What is the group of ingredients that came in a natural or synthetic compound which gives pleasant smell to the product?

- a. antibacterial
- b. foam enhancer
- c. fragrance
- d. thickener

6. What ingredient has the power to break down stains like in digestive system which helps break down the food we eat?

- a. enzymes
- b. fragrance
- c. solvents
- d. thickener

7. This ingredient balanced the acidity or base of a certain product. What is this ingredient?

- a. dye
 - b. fragrance
 - c. pH adjuster
 - d. solvents
8. What substance when added to a cleaning product makes it stable and safe for a longer period?
- a. enzymes
 - b. foam enhancer
 - c. pH adjuster
 - d. preservative
9. What kind of ingredient is used in cleaning products that help in creating a unique experience?
- a. dye
 - b. enzymes
 - c. fragrance
 - d. preservative
10. What is the pH of a certain product to be considered as basic?
- a. pH greater than 7
 - b. pH less than 7
 - c. average pH is 7
 - d. none of the above
11. What substance provides most of the cleaning power in cleaning products?
- a. antibacterial
 - b. enzymes
 - c. solvents
 - d. surfactants
12. What are these ingredients included in a hand hygiene product which provides reduction in germs?
- a. antibacterial
 - b. enzymes
 - c. fragrance
 - d. solvents
13. This substance can be extracted in natural compounds. Which of the following is a natural compound?
- a. flowers
 - b. fruits
 - c. nuts
 - d. all of the above
14. What substance helps the surfactant more powerful through the reaction of certain stuff which is found in tap water?
- a. antibacterial
 - b. builders
 - c. enzymes
 - d. fragrance
15. Which of the following ingredients is considered as the active substance in a cleaning product?
- a. enzymes
 - b. solvents
 - c. surfactants
 - d. thickener

Lesson

1

Use of the Other Ingredients in Cleaning Agents



In cooking, there are many interpretations of some dishes. But when one or two ingredients are lacking, the food that you will eat will not be delicious as what you expect. The same with the cleaning products. It is not only the active ingredient that plays an important role in cleaning agent but also the other ingredients.



What's In

Cleaning products or agents are very helpful in maintaining our home a conducive place for relaxation. They can remove dirt, dust, bad odor, and other contaminants present in every corner of our home. They have different ingredients that suit to different cleaning products. Some can kill virus and bacteria while being able to clean an area. Others contain ingredients that can remove grease or oil on the surface. Most of the cleaning agents remove the foul odor in the surroundings.



Notes to the Teacher

Keep on reminding the learners to take extra careful in handling different cleaning products. They must choose wisely the products they will buy. They should purchase those eco-friendly products.



What's New

Activity 1.1 “What’s that Word?”

Cleaning products play an essential role in daily life. They can remove dirt and stains from our clothes, dried on food from our dishes and even germs from our hands! Let’s learn more about the chemistry that makes this happen. But before that let’s solve these jumbled words below to see what our next lesson will be.

Direction:

Arrange the following jumbled letters to form the words related to cleaning agents/ingredients/products.

1. S N D H A
2. E A G S R E
3. I T D R
4. S V U R I
5. M U P F E R E
6. T A B E I A C R
7. E C N A L
8. U E H S O
9. L H T E H A
10. L A O H L C O
11. D I C A
12. G R D A E N
13. E G S A T R N M
14. O F R O L



What is It

Uses of the Other Ingredients in Cleaning Products

With the different household cleaning products that we have in the market today, we don't know which the best is to use in our household. We assume that these cleaning products are safe to use. In fact, many popular household cleaners are dangerously toxic. They contain different ingredients that are harmful to our health. Together with the active ingredient, there are other ingredients found in cleaning agents. Let's look at their uses.

1. Builders

Builders are one of the important group of ingredients that help make cleaning products better. Builders give the surfactants a helping hand. They are found in several different kinds of products, but you need less of them than you do surfactants.

Builders help make the surfactant more powerful by reacting with stuff found in tap water. Water in your home may contain minerals (such as calcium and magnesium). The more minerals in your water, the "harder" the water is. It is not bad to have minerals in water, but it can leave white marks on surfaces (like dishes). When calcium and magnesium are present in water, they will stop surfactants from being able to do their job of removing soil.

Builders help prevent this by keeping the minerals out of the way of the surfactants. This leaves the surfactants alone to focus on the soil.

2. Solvents

Solvents are chemicals that help ingredients stay mixed and gives cleaning products the right thickness, so they are easy to use. In addition, solvents can help to prevent liquid products from freezing in cold climates.

Without solvents, a product will be very thick. But for other products, we want the liquid to pour out of the bottle. When we add solvents, we decrease the viscosity, meaning the liquid will move faster when poured out of the bottle. The solvent also helps to make sure we do not end up with a separated solution like when you have pulp at the bottom of your glass of orange juice.

3. Enzymes

Enzymes are powerful stain removing ingredients. Their power is to break down stains just like the enzymes in our digestive system help break down the food we eat. Enzymes are not living organisms but are created by naturally occurring microorganisms, like bacteria and fungi. In the laboratory, we use carefully selected microorganisms and allow them to grow in a very controlled environment. As they grow, they produce the desired enzymes.

4. Fragrances

Fragrances are a group of ingredients that provide the cleaning product with a pleasant smell. They are not found in every product, and typically a very small amount can make a large difference in smell. In many cases, the fragrance is the driving factor for why someone decided to buy a specific product.

A fragrance is a mix of many different substances. These ingredients may be natural compounds (that come from materials like flowers, fruit, trees, plants, or nuts), essential oils, or synthetic compounds.

5.Preservatives

Just like it is important to prevent food from spoiling, cleaning products need to be preserved as well. Adding a small amount of a preservative protects the product from microorganisms.

A preservative is a substance that is added to a cleaning product in order to make it stable and safe for a longer period. Without a preservative, it is possible for bacteria or fungi to grow in the product. This can cause the ingredients in the product (like surfactants and enzymes) to break down and not work as well. Adding a preservative allows a cleaning product to stay on the shelf longer both in the store and in your home.

6. pH Adjusters

Every cleaning product needs to be “balanced” to work well and to be safe for your skin. In order to do this, chemists use pH adjusters to make sure the product is balanced and safe for you to use. The amount used depends on the other ingredients in the formula.

pH is a measure of how acidic (like lemon juice) or basic (like baking soda) a solution is. One way to measure this is by using the pH scale. The pH scale is read from 0 to 14 and tells us if a solution is acidic or basic. Pure water has a pH of 7, which means it's neutral.

pH adjusters are used in cleaning products to raise or lower the pH of a solution, making it either more basic or acidic.

Chemists make sure that the product is effective while balancing safety, in part, by making sure the pH will not be harmful if it touches your skin.

If the pH is less than 7, then the solution is acidic. Lemon juice has a pH around 2. Our skin is slightly acidic, with a pH on average near 5. If our skin comes into contact with a chemical that is too acidic it can cause itching or discomfort.

Adjusting the pH helps to keep the product working well as it gets old. It also affects how the product cleans. For example, each surfactant has a different pH level in which they are the most powerful. Therefore, a chemist may want to adjust the pH to that level.

If the pH is greater than 7, then the solution is basic. For example, baking soda has a pH of around 9. If a solution is too alkaline (basic), it can also irritate your skin.

7.Dye

There are several other ingredients used in cleaning products that help create a unique experience. For example, dye can be used to give a product color.

8. Thickener

Thickeners give soap the proper viscosity (thickness), making sure it can still flow out of a bottle. Can you imagine trying to wash your hands with a soap that feels like water? It would run right off your skin!

9. Foam Enhancer

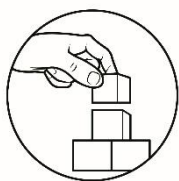
Foam Enhancers help create suds or bubbles. While not necessary for effective cleaning, many people feel bubbles show that a product is working.

10. Antibacterial or Disinfecting Ingredients

Cleaning washes away germs with any dirt and soil that is removed, but a further reduction of germs can be achieved by using additional ingredients that will kill germs.

Antibacterial or disinfecting ingredients can be included in a cleaning or hand hygiene product or used separately after cleaning. Their use provides a further reduction in germs on our hands or surfaces in our homes. This reduction of germs helps to prevent people from getting sick when commonly used surfaces, such as door handles, or our hands are cleansed using these products. In environments with sick individuals or where food is prepared, this is especially important.

There are many different types of antibacterial or disinfecting ingredients. Depending on the chosen ingredient used in a product, it may be more effective on certain microbes that make us sick like bacteria, viruses or mold.



What's More

Activity 1.2 “A Powerful Tool”

Direction:

Make a short poem about the use of other ingredients found in household cleaning products incorporating your answers in Activity 1.1.

Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information are clearly presented and ordered in such a way that it brings a full picture of the material	Information are clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
Creativity	It is visually inviting and easy to read	Visually inviting and easy to read	Visually pleasing and readable	Readable	
Spelling and Grammar	All spelling and grammar are correct	Some spelling and grammar error	Some spelling and grammar error	Notable spelling and grammar error	
Punctuality	Submitted on time	Submitted on time	Submitted on time	Submitted after the deadline	
				TOTAL	

Highest possible score: $(4 \times 4) / 4 = 4$ components

Sample Score Sheet

Adjectival Rating

Criteria	Score
Content	3
Creativity	3
Spelling and Grammar	3
Punctuality	4
TOTAL	13

Learner is within the Merit range and the teacher may choose a grade within this range

13 pts/4 categories= 3.25



What I Have Learned

Activity 1.3 “Puzzled Ingredient”

Direction: Find in the puzzle the given words below.

Adjuster

Builders

Enhancer

Dye

Enzyme

Fragrance

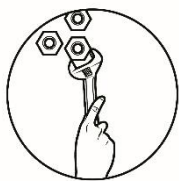
Disinfectant

pH

Preservative

Solvents

E	N	H	A	N	C	E	R	T	B	S	F
S	E	A	R	B	C	N	Y	A	U	E	R
M	O	F	I	G	H	Z	B	X	I	J	A
O	C	L	C	L	M	Y	Z	C	L	O	G
N	P	T	V	A	S	M	D	U	D	R	R
J	S	B	D	E	R	E	V	E	E	T	A
U	P	E	S	W	N	S	F	T	R	Z	N
I	H	Y	A	I	O	T	S	G	S	B	C
C	A	D	J	U	S	T	E	R	E	J	E
D	I	S	I	N	F	E	C	T	A	N	T
P	R	E	S	E	R	V	A	T	I	V	E



What I Can Do

Activity 1.4 “A Safe Environment”

Direction: With your knowledge on the different ingredients of cleaning products, make a poster on safe storage and use of the different cleaning agents. Write a short description of your work.

Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information are clearly presented and ordered in such a way that it brings a full picture of the material	Information are clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
Creativity	It is visually inviting and easy to read	Visually inviting and easy to read	Visually pleasing and readable	Readable	
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Punctuality	Submitted on time	Submitted on time	Submitted on time	Submitted after the deadline	
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Highest possible score: $(4 \times 4) / 4 = 4$ components

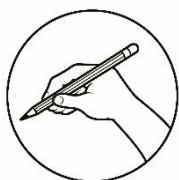
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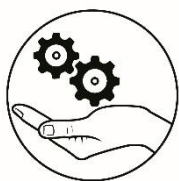
Assessment

Direction: Write the letter that match the different ingredients of cleaning agents with their uses.

“Use of Different Ingredients”

Use	Ingredients
1. Washes away germs with any dirt	A. Antibacterial

2. Give surfactants a helping hand	B. Builders
3. Create suds or bubbles	C. Dye
4. Give cleaning agents the right thickness	D. Enzymes
5. Making the product balanced	E. Foam enhancer
6. Powerful stain removing ingredient	F. Fragrance
7. Protects products from microorganism	G. pH
8. Provide product with a pleasant smell	H. pH adjuster
9. Helps keep minerals out of way	I. Preservatives
10. Prevents products from freezing	J. Solvents
11. Mix of many different substances	
12. Allows cleaning product to stay longer	
13. Measures how a solution is acid or base	
14. Helps create a new experience	
15. Prevent people from getting sick	



Additional Activities

Activity 1.5 “Healthy Atmosphere”

Direction:

Read an article about the effectiveness of a cleaning agent in reducing the occurrence of diseases. Write your short opinion on a separate sheet of paper.

Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information are clearly presented and ordered in such a way that it brings a full picture of the material	Information are clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
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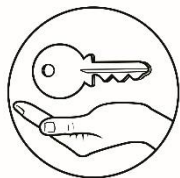
Highest possible score: (4x4)/4= 4 components

Adjectival Rating Sample Score Sheet

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TOTAL	13

13 pts/4 categories= 3.25

Learner is within the Merit range and the teacher may choose a grade within this range.



Answer Key

<p>What I Know</p> <p>1. A 2. A 3. C 4. B 5. C 6. A 7. C 8. D 9. A 10. A 11. D 12. A 13. D 14. B 15. C</p>	<p>What's New</p> <p>1. HANDS 2. GREASE 3. DIRT 4. VIRUS 5. PERFUME 6. BACTERIA 7. CLEAN 8. HOUSE 9. HEALTH 10. ALCOHOL 11. ACID 12. DANGER 13. GARMENTS 14. FLOOR 15. TEXTURE</p>	<p>What I Have Learned</p> <table><tr><td>E</td><td>N</td><td>H</td><td>A</td><td>N</td><td>C</td><td>E</td><td>R</td><td>T</td><td>B</td><td>S</td><td>F</td></tr><tr><td>S</td><td>E</td><td>A</td><td>R</td><td>B</td><td>C</td><td>N</td><td>Y</td><td>A</td><td>U</td><td>E</td><td>R</td></tr><tr><td>M</td><td>O</td><td>F</td><td>I</td><td>G</td><td>H</td><td>Z</td><td>B</td><td>X</td><td>I</td><td>J</td><td>A</td></tr><tr><td>O</td><td>C</td><td>L</td><td>C</td><td>L</td><td>M</td><td>Y</td><td>Z</td><td>C</td><td>L</td><td>O</td><td>G</td></tr><tr><td>N</td><td>P</td><td>T</td><td>V</td><td>A</td><td>S</td><td>M</td><td>D</td><td>U</td><td>D</td><td>R</td><td>R</td></tr><tr><td>J</td><td>S</td><td>B</td><td>D</td><td>E</td><td>R</td><td>E</td><td>V</td><td>E</td><td>E</td><td>T</td><td>A</td></tr><tr><td>U</td><td>P</td><td>E</td><td>S</td><td>W</td><td>N</td><td>S</td><td>F</td><td>T</td><td>R</td><td>Z</td><td>N</td></tr><tr><td>I</td><td>H</td><td>A</td><td>V</td><td>I</td><td>O</td><td>T</td><td>S</td><td>G</td><td>S</td><td>B</td><td>C</td></tr><tr><td>C</td><td>A</td><td>D</td><td>J</td><td>U</td><td>S</td><td>T</td><td>E</td><td>R</td><td>E</td><td>J</td><td>E</td></tr><tr><td>D</td><td>I</td><td>S</td><td>I</td><td>N</td><td>F</td><td>B</td><td>C</td><td>T</td><td>A</td><td>N</td><td>T</td></tr><tr><td>F</td><td>R</td><td>E</td><td>S</td><td>E</td><td>R</td><td>V</td><td>A</td><td>T</td><td>I</td><td>V</td><td>E</td></tr></table>	E	N	H	A	N	C	E	R	T	B	S	F	S	E	A	R	B	C	N	Y	A	U	E	R	M	O	F	I	G	H	Z	B	X	I	J	A	O	C	L	C	L	M	Y	Z	C	L	O	G	N	P	T	V	A	S	M	D	U	D	R	R	J	S	B	D	E	R	E	V	E	E	T	A	U	P	E	S	W	N	S	F	T	R	Z	N	I	H	A	V	I	O	T	S	G	S	B	C	C	A	D	J	U	S	T	E	R	E	J	E	D	I	S	I	N	F	B	C	T	A	N	T	F	R	E	S	E	R	V	A	T	I	V	E
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<p>What I Know</p> <p>1. A 2. A 3. C 4. B 5. C 6. A 7. C 8. D 9. A 10. A 11. D 12. A 13. D 14. B 15. C</p>	<p>What's More</p> <p>Answers may vary. Refer to rubrics for scoring.</p>	<p>Additional Activities</p> <p>Answer may vary. Refer to rubrics for scoring.</p>																																																																																																																																				

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